



Aircraft Aerosol Mass Spectrometer Measurements over the Los Angeles Basin during CalNex

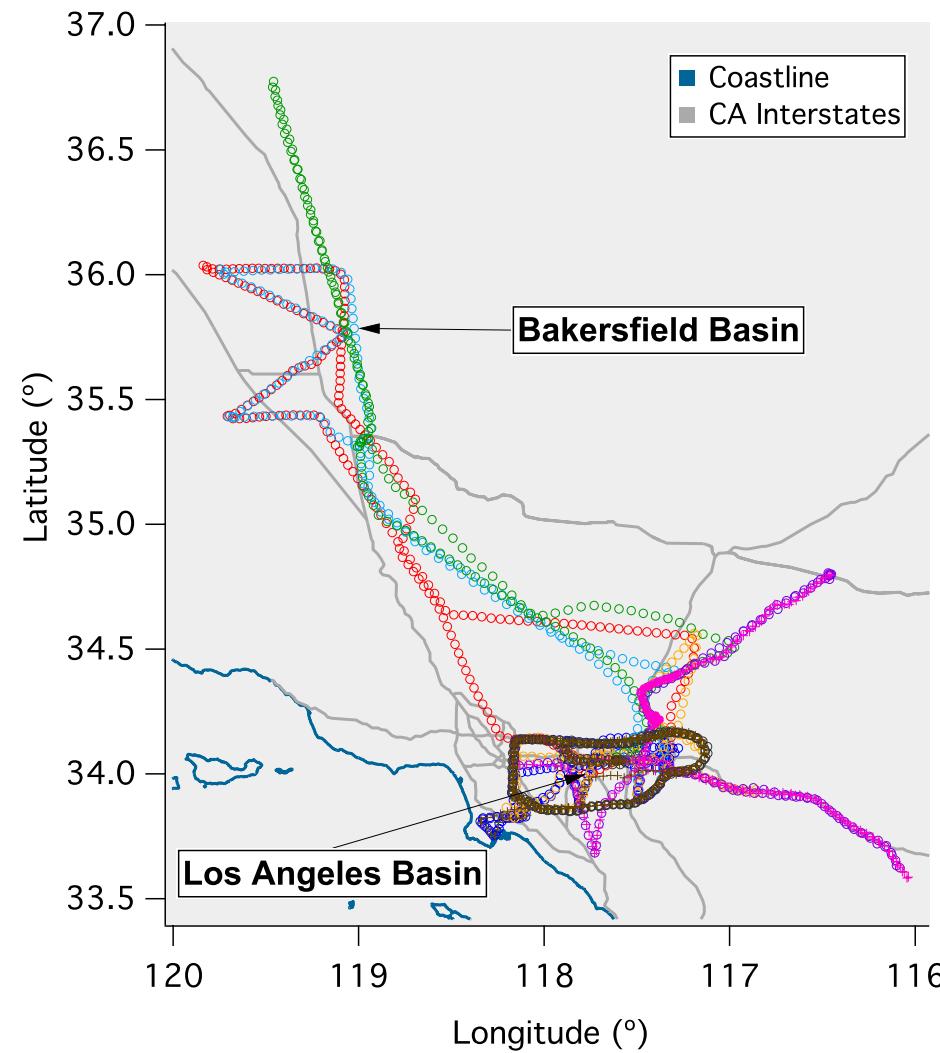
Jill S. Craven

Caltech, Seinfeld/Flagan Research Group

Presented at CalNex Data Analysis Workshop



Flight Path Overview

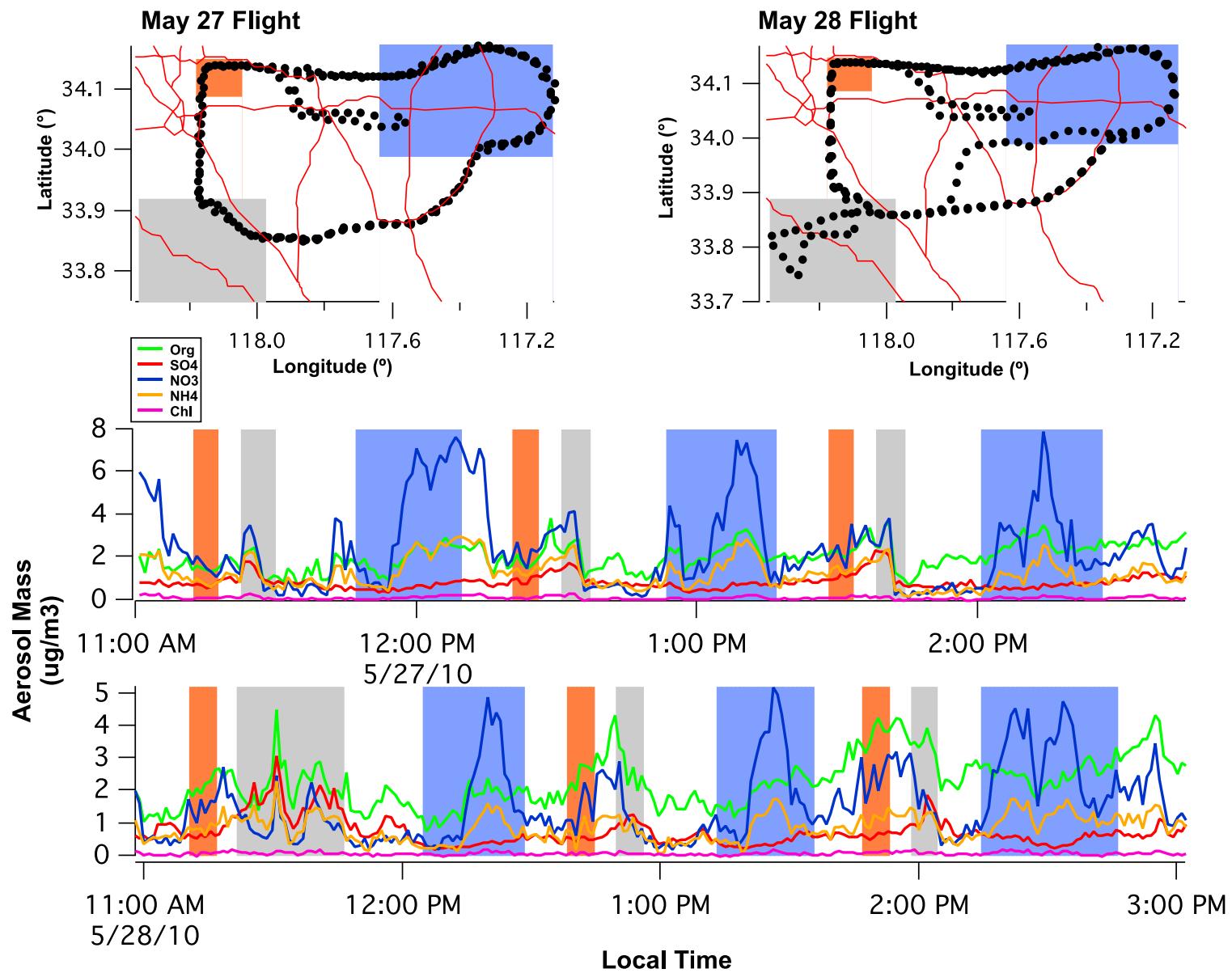


RF #	Flight Date	Mission Type
10	5/18/10	San Joaquin valley, just after a front
11	5/19/10	LA Basin, coordinated flight plan, N-S tracks
12	5/20/10	San Joaquin valley, morning clouds; El Cajon pass
13	5/21/10	LA Basin, 2 loops, N-S tracks, El Cajon & Banning passes
14	5/22/10	San Joaquin valley, N-S track up to Fresno and back
15	5/24/10	LA Basin, with Santa Ana, El Cajon pass, and Salton Sea
16	5/25/10	LA Basin, with Santa Ana, El Cajon pass, and Salton Sea
17	5/27/10	LA Basin, 3 loops
18	5/28/10	LA Basin, 3 loops, with tanker fire on 91



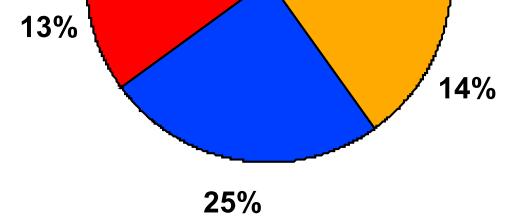
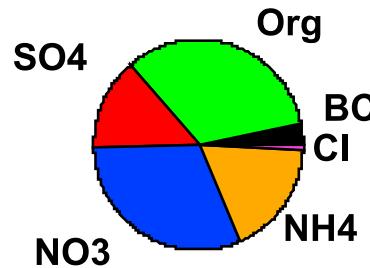
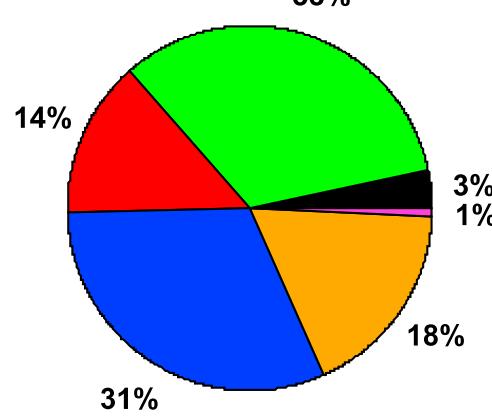
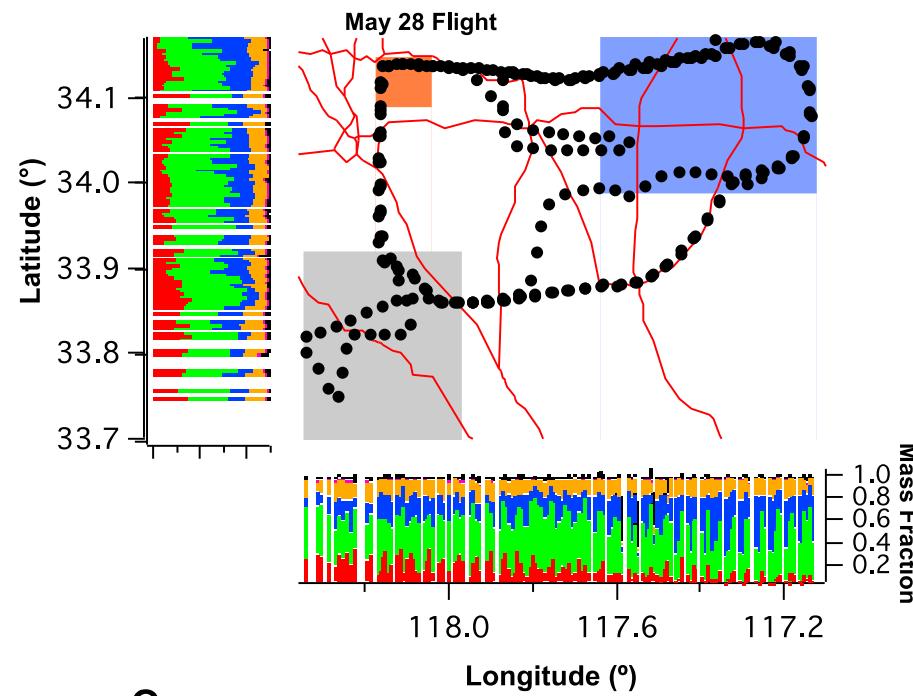
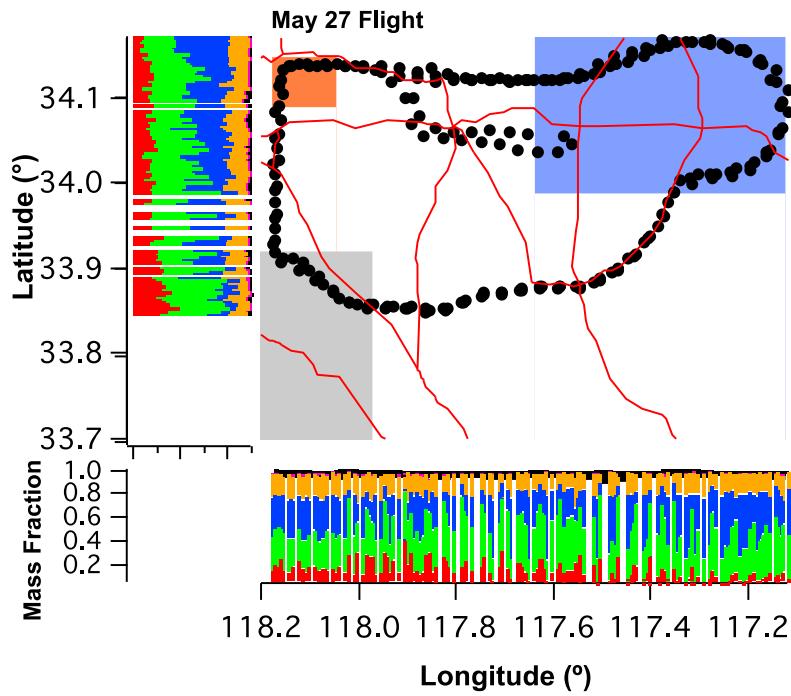


LA Basin Aerosol Composition: Regional Differences



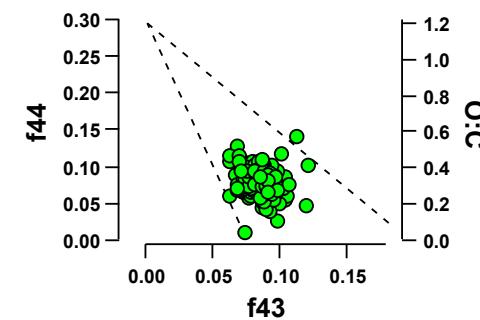
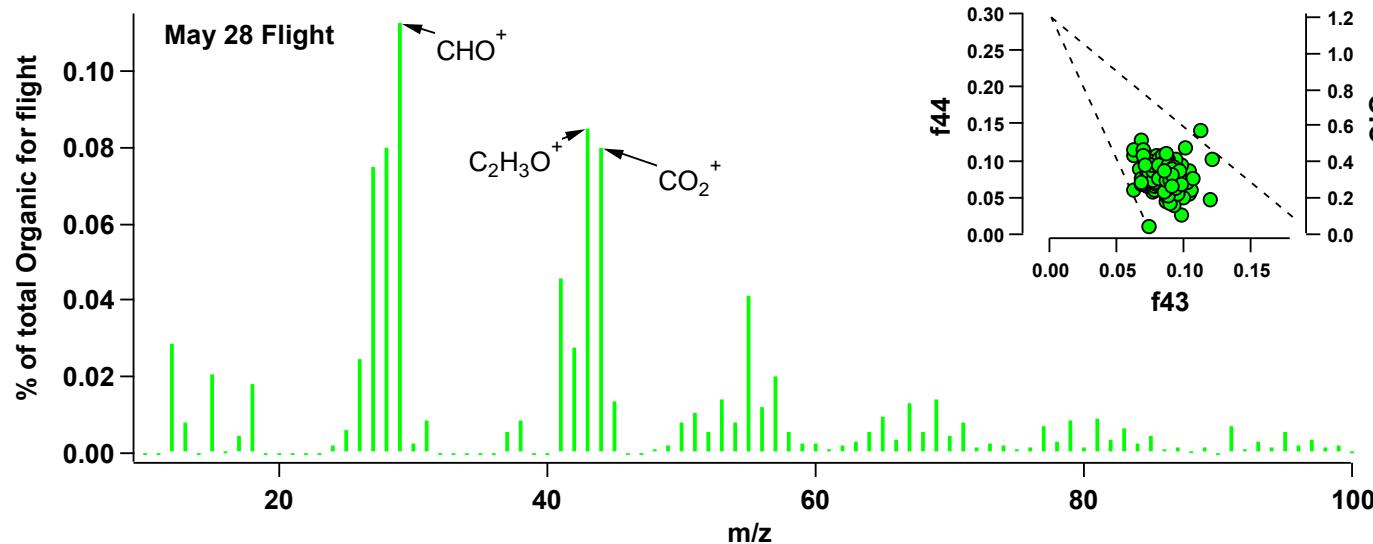
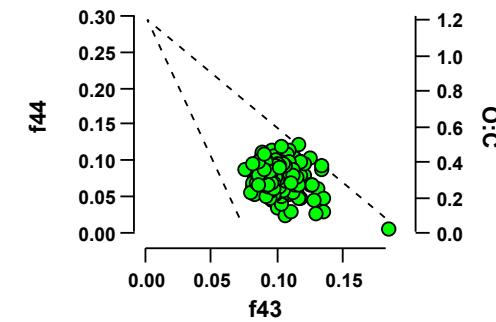
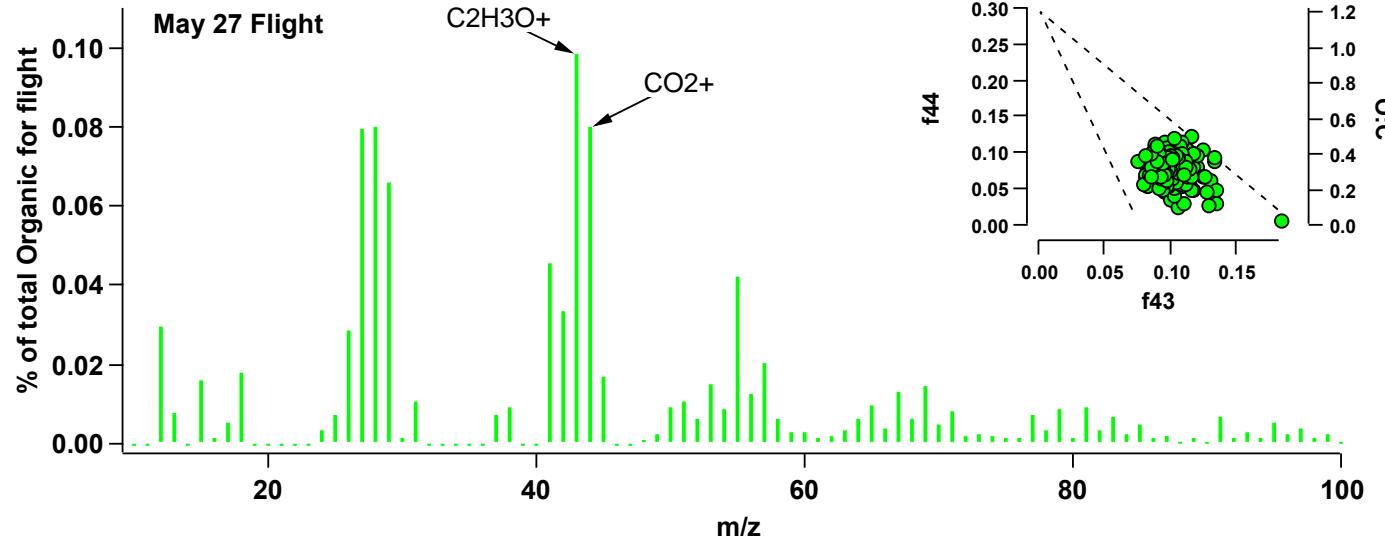


LA Basin Aerosol Mass Fraction





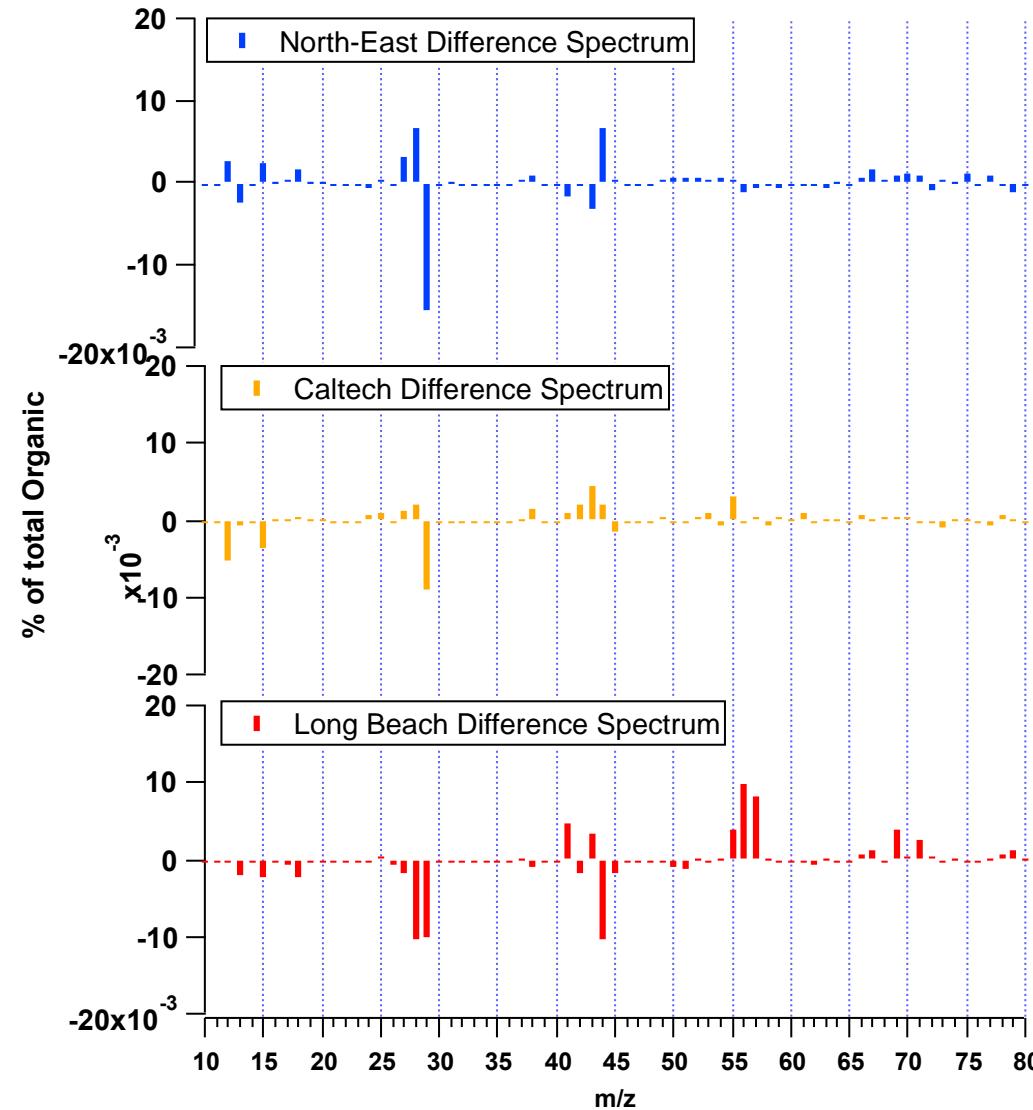
LA Basin Average Organic Mass Spectrum





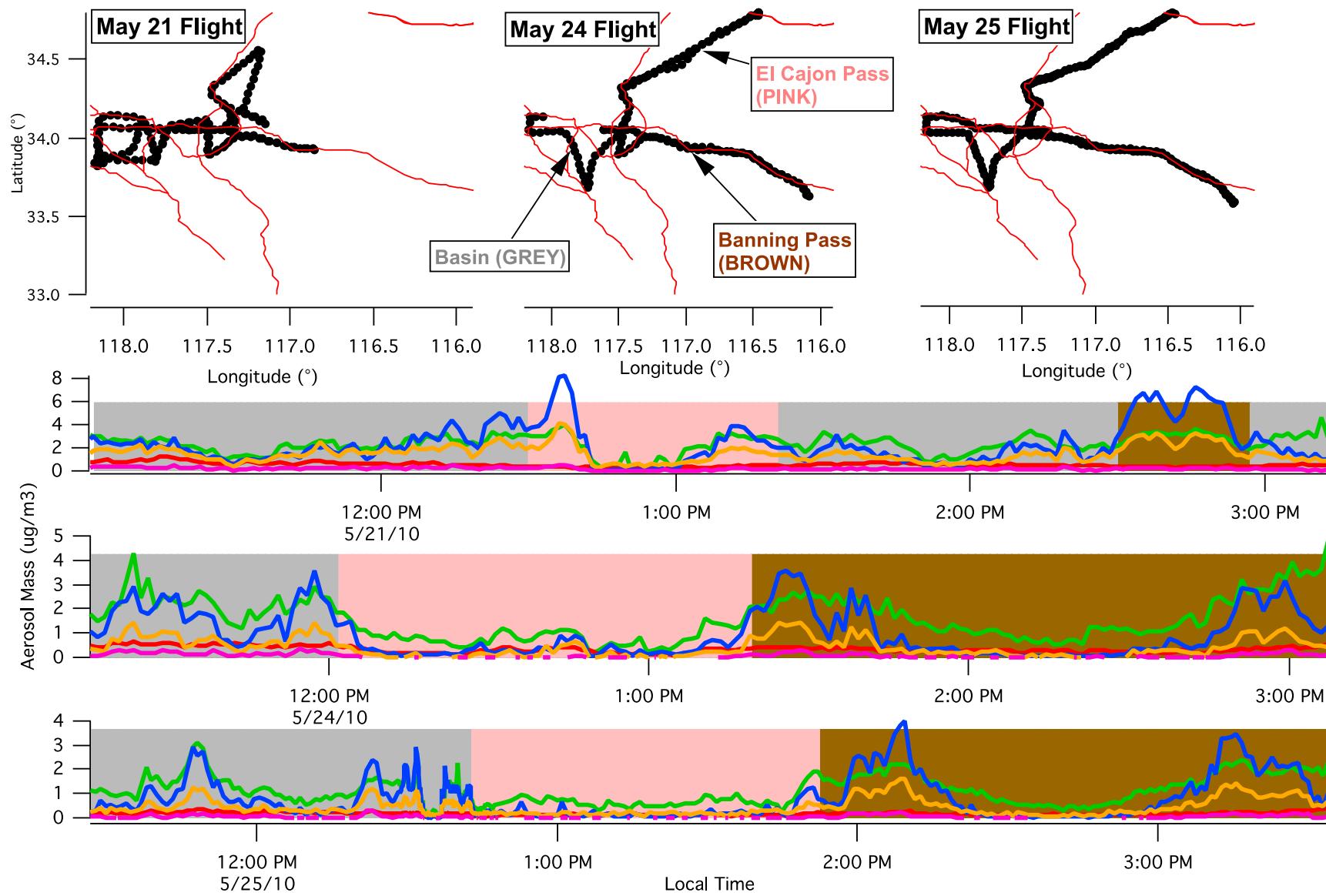
LA Basin Difference Spectra

May 28 Flight



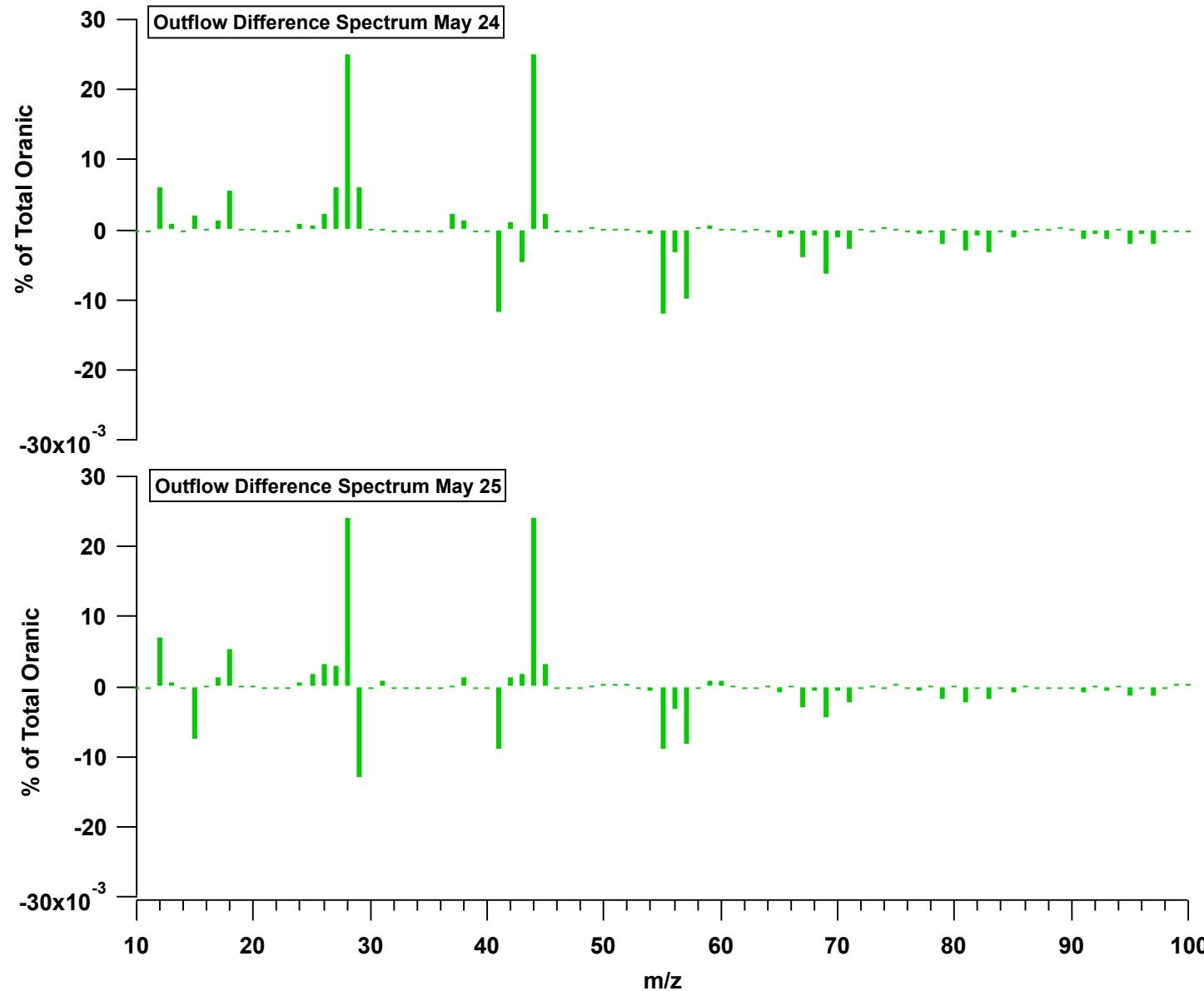


LA Basin vs Outflow Aerosol Composition



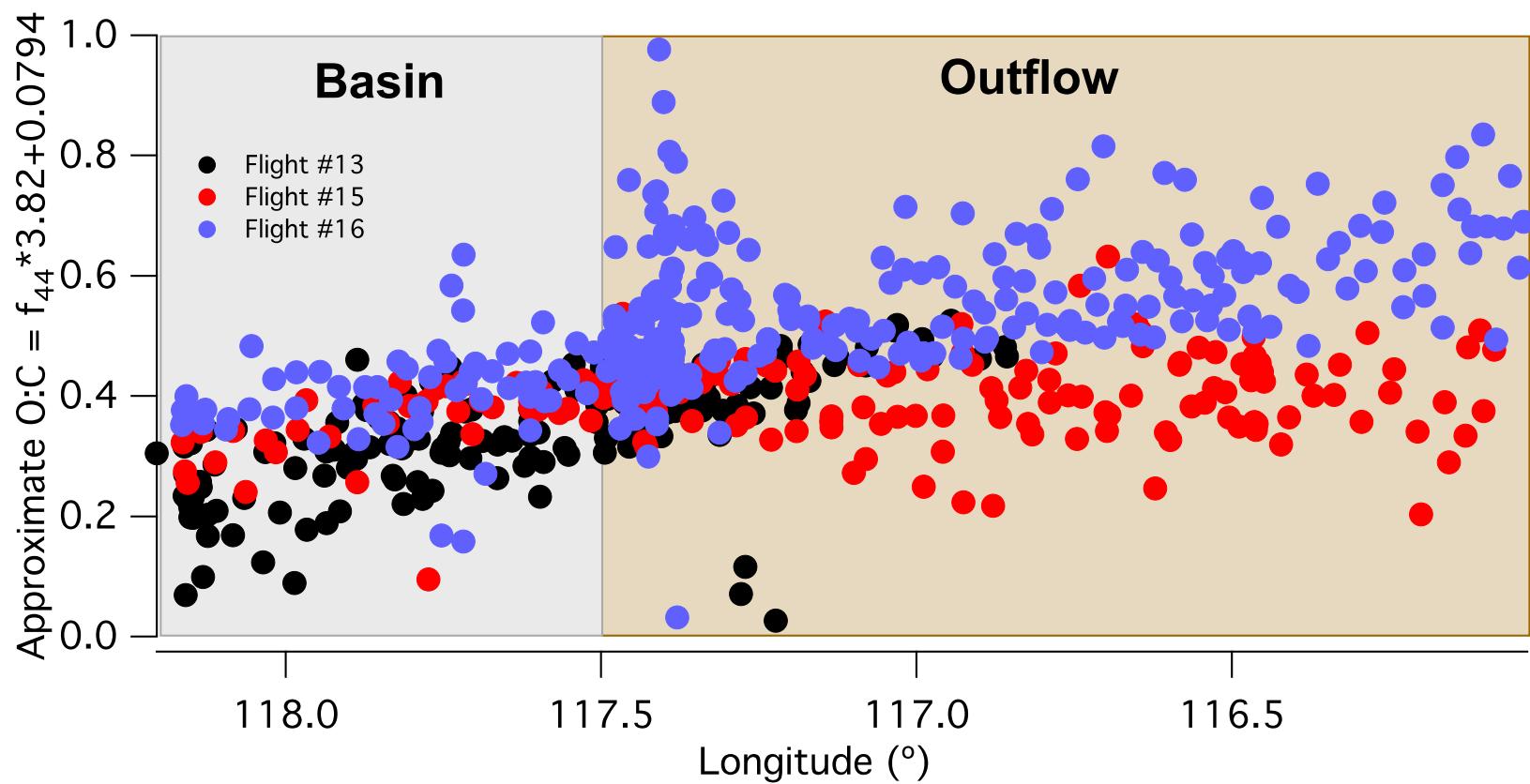
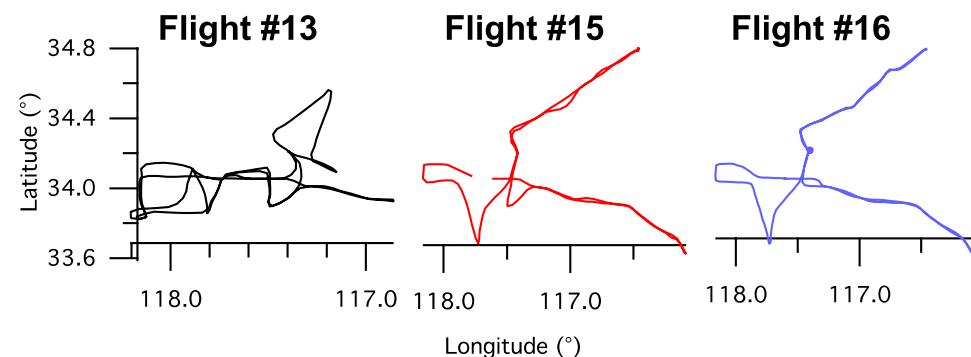


Outflow Difference Organic Mass Spectrum





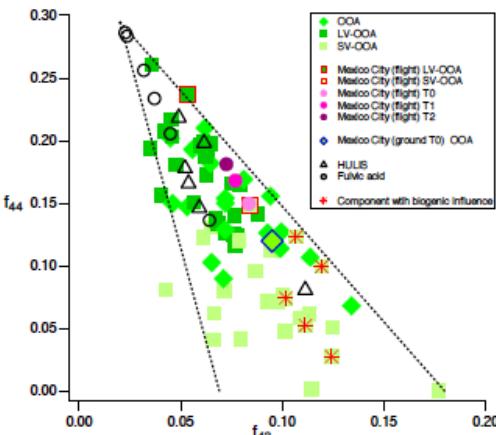
Organic Composition vs Longitude



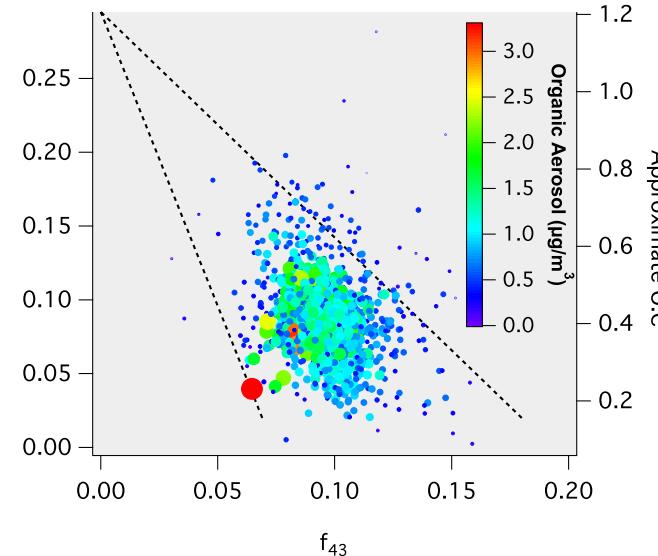


f44 vs f43 plot

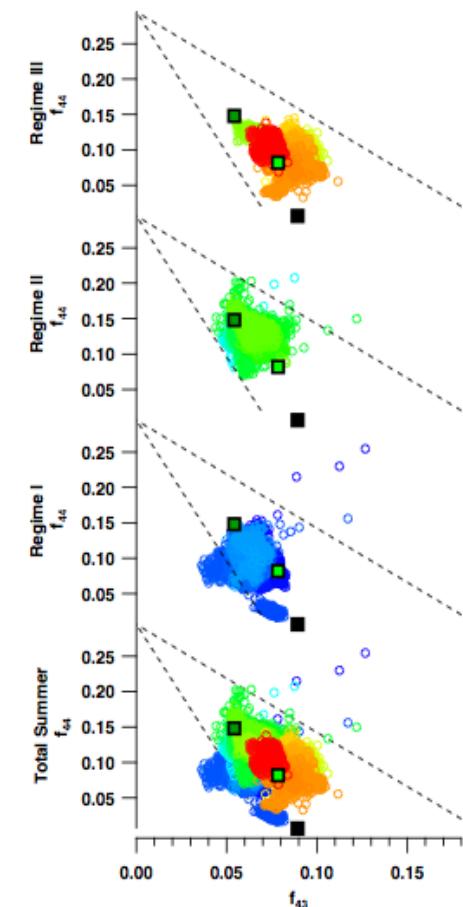
Ng et al. 2010 ACP



CalNex Twin Otter Data



PACO Study from 2009
Hersey et al. 2010 ACPD



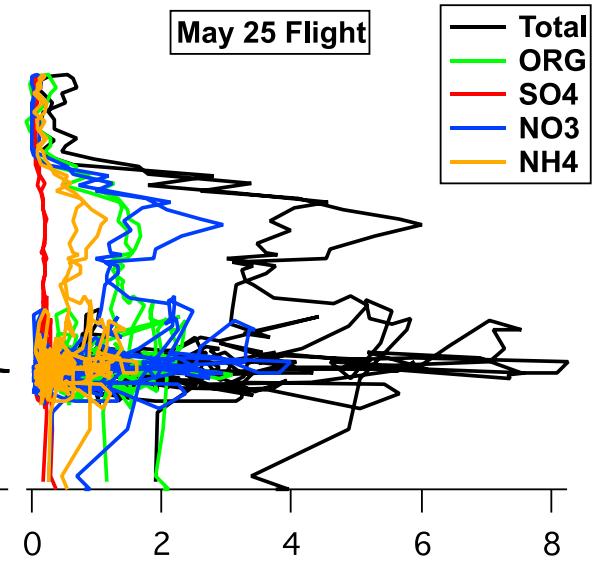
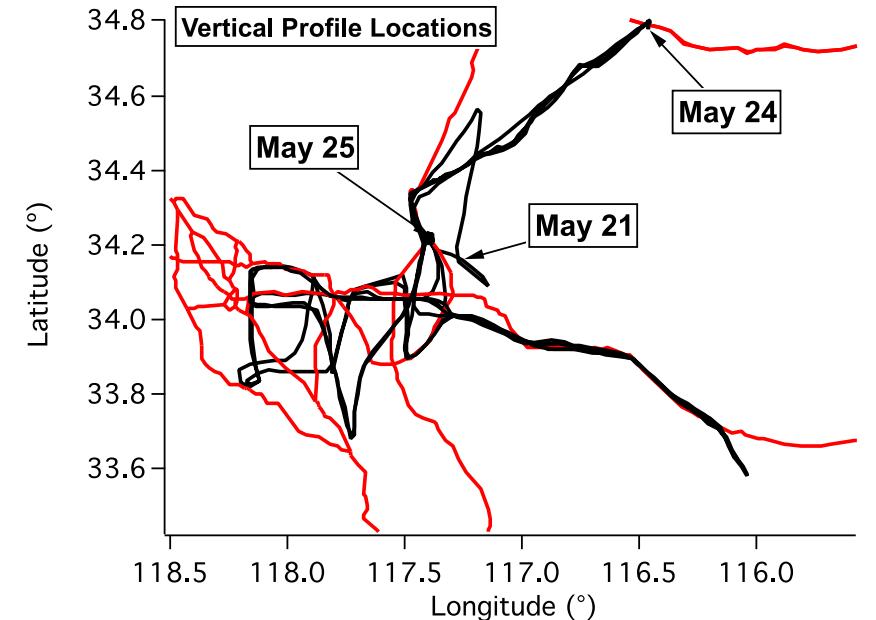
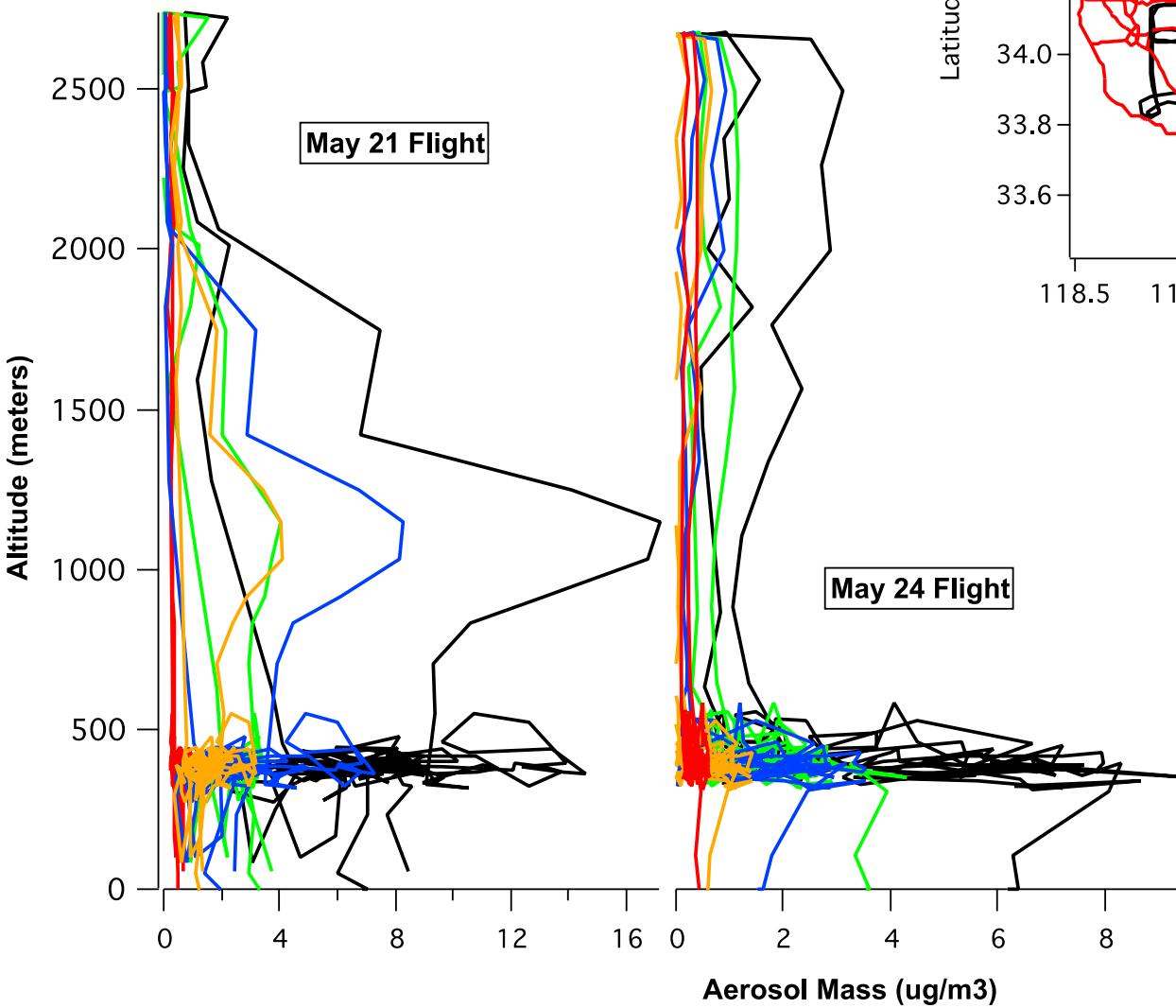
- $m/z 44$ (mostly CO_2^+)
- $m/z 43$ (mostly $\text{C}_2\text{H}_3\text{O}^+$)
- spectral signatures of acid-derived species and non-acid oxygenates, respectively
- $f_{44} = (m/z44)/(total\ organic)$
- $f_{43} = (m/z43)/(total\ organic)$

- **Organic Aerosol in LA Basin at 1200 feet AGL is mostly SV-OOA type aerosol**
- Future PMF analysis will rigorously show the different contributions to LA Basin organic aerosol

- **Organic aerosol composition varies over summer months**

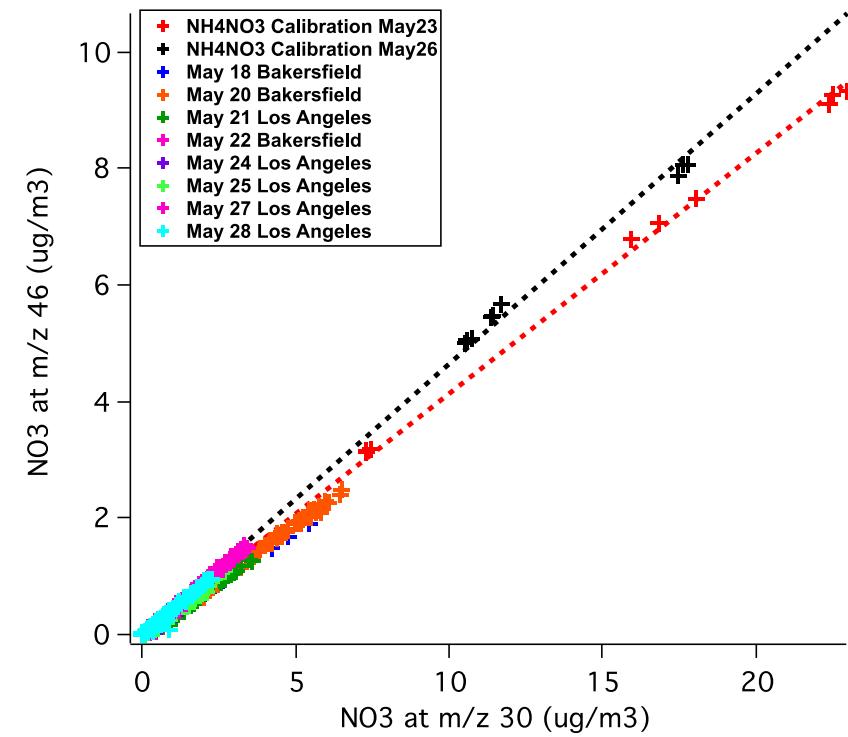
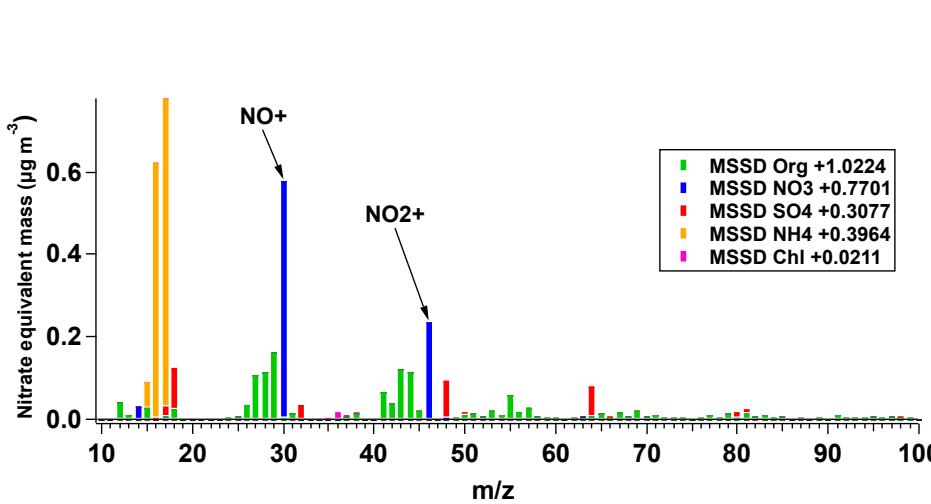


Vertical Profiles





Aerosol Nitrate

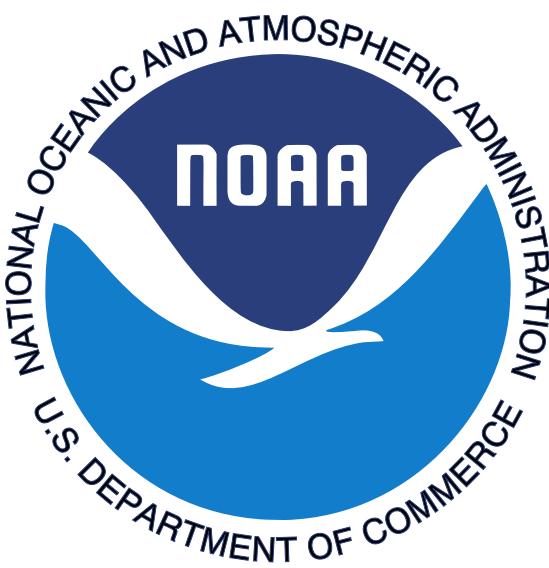


- Aerosol Nitrate in both Los Angeles and Bakersfield is largely inorganic nitrate



Acknowledgements

- NOAA
- CIRPAS Mechanic, Pilots, and Scientists
- Scientists from University of Arizona,
Georgia Tech, University of California
San Diego and Caltech



Poster 23: Black Carbon

Poster 24: CCN

Poster 26: WSOC

